

# Surface Water Quality Standards Stakeholder Meeting

*Conceptual Approach to Address  
Drinking Water-Based Criteria Concerns*



December 17, 2012  
NJDEP Public Hearing Room

# Background



December 17, 2012

Debra Hammond, Chief

NJDEP: Bureau of Water Quality Standards and Assessment

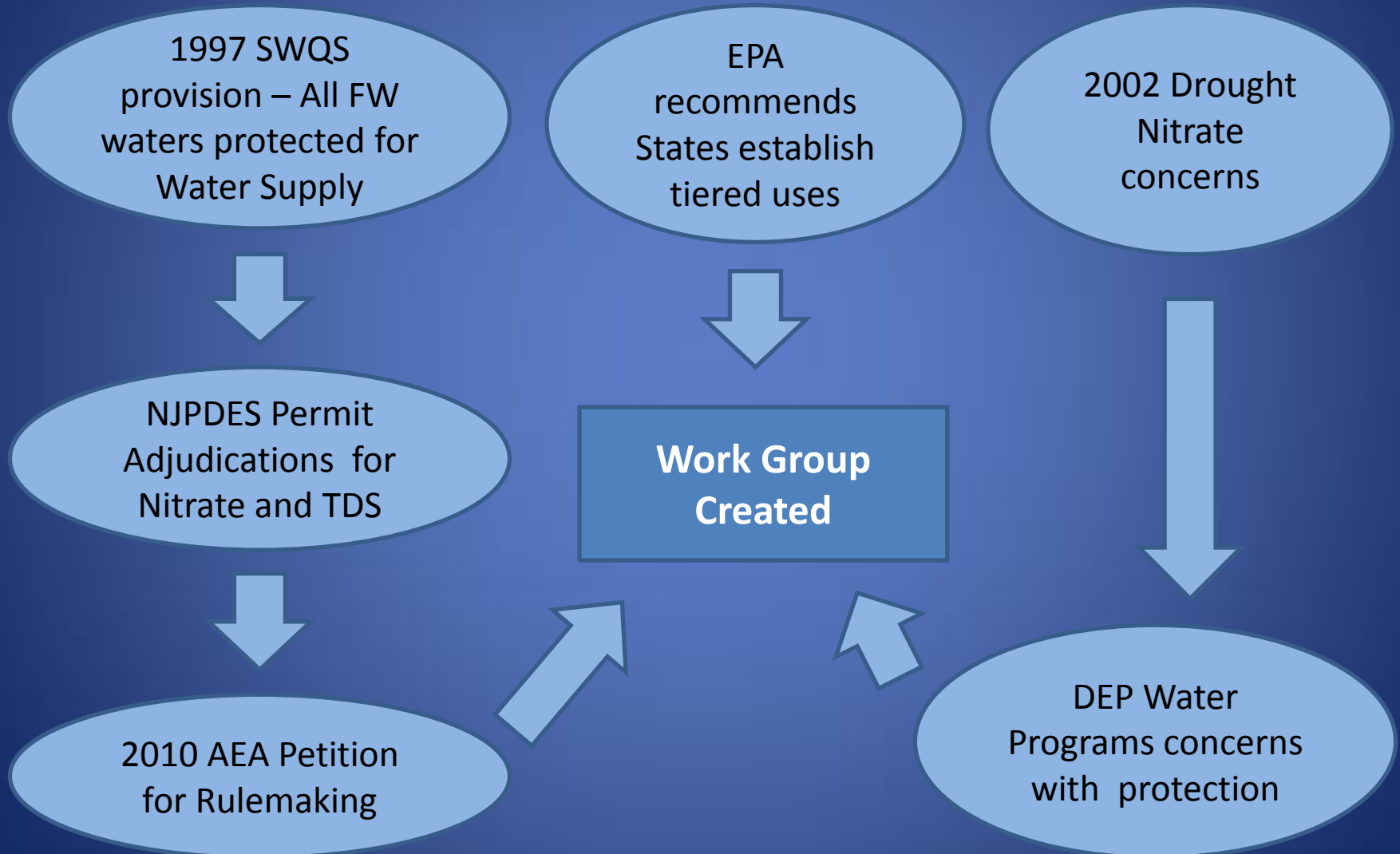
# Surface Water Quality Standards

- CWA Section 303(c) - States required to review WQS once/3 years. WQS must be approved by EPA.
- WQS must include designated uses, narrative and numeric water quality criteria, stream classifications & implementation policies
- Last triennial approval 2010. Next review 2013
- Today's discussion focuses on possible amendments before the triennial review.

# What's the problem with Nitrate and TDS

- SWQS and Safe Drinking Water Act both have Nitrate criteria of 10 mg/l
  - In the SDWA, expressed as a MCL (not to exceed)
  - In the SWQS, expressed as a 30-day average criterion
- Potable water treatment is typically not designed to remove nitrate
- Existing SWQS criteria for TDS of 500 mg/l is based on a secondary drinking water standard
- Most surface waters are not used for water supply
- Reverse osmosis is applicable technology to treat for TDS

# Forcing Factors



# Work Group Members

<b>State/Federal</b>	Debra Hammond	NJDEP WMS
	Jason Lonardo	NJDEP BSWP
	Jeff L Hoffman	NJDEP DWS
	Sandy Krietzman	NJDEP DWS
	Kristen Heinzerling	NJDOL
	Wayne Jackson	EPA Region 2
<b>AEA</b>	Pat Matarazzo	Verona Township
	Robert Bongiovonni	Two Bridges SA
	Jim Cosgrove	OMNI Environmental
	Michael Rogers	Monroe Township
	Pam Carolan	Mt. Laurel Township
	Pat Kehrberger	Kehrberger Associates

# DEP Goals – Ground Rules

- Enhance protections at existing potable water intakes
- Protect water quality for the future
- Establish a common sense approach for requiring treatment
- Establish a transparent process that is implementable

# Points of Agreement

- Changes to SWQS such as...
  - numeric criteria
  - averaging periods
  - design flows
  - implementation for nitrate, TDS and other human health criteria could be considered
- Must work with the assessment process, NJPDES permitting program and the Water Supply Master Plan
- May not solve problems for all
- Must address future water supply needs
- Other regulatory actions might result in more stringent requirements

# Options Considered

- Nitrate:
  - Establish new drinking water designated uses and reclassify streams.
  - Site specific use assessments leading to reclassification
  - Change the criteria and implementation depending on current and future status as a water supply
- TDS:
  - Use WET as a surrogate for compliance with DW standard.
  - Reevaluate the existing numerical criteria to adequately and fairly protect the aesthetic nature of the drinking water
  - Change the criteria and implementation depending on current and future status as a water supply

# Questions?

# Conceptual Approach for TDS, Chloride, and Sulfate



December 17, 2012

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NJDEP: Bureau of Surface Water Permitting

# Current Criteria Based on Secondary Drinking Water Standards

- Current Criteria
  - TDS = 500 mg/L
  - Chloride = 250 mg/L
  - Sulfate = 250 mg/l
- Citations:
  - SWQS N.J.A.C. 7:9B-1.14
  - State Secondary Drinking Water Regulations N.J.A.C. 7:10-7.2(a)2.
  - National Secondary Drinking Water Regulations 40 CFR Part 143

# **Reasons Why TDS, Chloride and Sulfate Should Be Linked**

- All secondary drinking water standards
- All require RO treatment to remove
- All are covered by the taste and odor narrative criteria

# Conceptual Approach

- Enhance narrative criteria
  - Taste and odor producing substances
- Changes to numeric criteria
  - TDS
  - Chloride
  - Sulfate
- Retain criteria for protection of aquatic life
  - Chloride
  - TDS

# **Narrative Criteria at N.J.A.C. 7:9B-1.14(d)**

- Change “Taste and Odor Producing Substances” to “Organoleptic and/or Aesthetic Response Producing Substances”
- New Narrative:
  - None offensive to humans or which would produce offensive taste or odors in biota used for human consumption. None which would render the water unsuitable for the designated uses.
    - All Classifications
  - None which would, singly or in combination, render water supplies unduly unpalatable or aesthetically objectionable.
    - FW2 Waters

# Total Dissolved Solids (TDS)

- Conceptual Criteria:
  - No increase in background which may adversely affect the survival, growth or propagation of the aquatic biota.
    - Apply to FW2 waters.
  - None which would render the water unsuitable for the designated or existing uses
    - Apply to all water classifications
- Move WET LC50  $\geq$  50% implementation statement from existing N.J.A.C. 7:9B-1.14(d)8.i. to N.J.A.C. 7:9B-1.5(e)8.

# Chloride & Sulfate

- Chloride:
  - Remove human health non-carcinogenic criterion of 250 mg/L.
  - Retain aquatic life protection criteria; acute = 860 mg/l, chronic = 230 mg/L
- Sulfate:
  - Remove numerical criterion of 250 mg/L.
  - No existing aquatic life criterion.

# Questions?

- Your thoughts?
- Is the change to narrative criteria sufficiently protective of drinking water?

# Conceptual Approach for Nitrate



December 17, 2012

Jason Lonardo

NJDEP: Bureau of Surface Water Permitting

# Changes to Nitrate Criterion

- No change to magnitude (i.e. 10 mg/L)
- Change in Averaging Period:
  - Current: 30-day average.
  - Suggested : 1-hour average.
- Change in Associated Design Flow:
  - Current : 7Q10
  - Suggested : 1Q10

# Nitrate Criteria Implementation

## *Definitions*

- “Critical drinking water supply location” (CDWSL):
  - Any point on a waterbody ...
    - where a permitted direct or indirect potable surface water intake is located; or
    - adjacent to a potable ground water source under the direct influence of surface waters (GWUDI).

# Nitrate Criteria Implementation

## *Definitions (con't)*

- “Type 1 public potable water supply use waters”:
  - FW2 waters upstream of an CDWSL designated for existing and potential public potable water supply use protections.
  - Exclusions include waters where...
    - the closest downstream CDWSL is on the Delaware River; or
    - the downstream CDWSL is designed to ensure compliance with all applicable primary drinking water regulations.
- “Type 2 public potable water supply use waters”:
  - FW2 waters not defined as Type 1 public potable water supply use waters and designated for potential public potable water supply use protections.

# Nitrate Criteria Implementation

## *Type 1 waters*

- Concept:
  - Water quality modeling to examine future nitrate concentrations at CDWSL(s)
  - Set effluent limits on point sources, pursuant to N.J.A.C. 7:9B-1.5(e)1, to protect the CDWSL(s).
- Target concentrations at CDWSLs:
  - 10 mg/L under critical flow conditions (i.e. 1Q10)
  - 5 mg/L under average flow conditions (TBD)
- Point Source Effluent Inputs:
  - “Permitted” effluent flows (i.e. design flows)
  - Existing discharge concentrations

# Nitrate Criteria Implementation

## *Type 1 waters (con't)*

- Minimum requirements for DSW dischargers:
  - Effluent monitoring and reporting requirements
  - Action levels (concentration or load-based triggers)
- Most stringent requirement for DSW dischargers:
  - Imposition of effluent limitations that ensure protection of the CDWSL(s)
- Overall approach will result in three (3) different scenarios

# Nitrate Criteria Implementation

## *Type 1 waters (con't)*

- Scenario 1: Current NJDEP-approved water quality model (e.g. Passaic, Raritan, etc..)
  - Adopt WQMP amendment with effluent requirements for the DSW dischargers to protect the CDWSL(s).
- Scenario 2: No NJDEP-approved WQ model; Single NJPDES discharger upstream of CDWSL(s)
  - Use conservative mass balance modeling approach to evaluate and set effluent requirements on the DSW discharger to protect the CDWSL(s).
  - Results imposed through individual NJPDES permits rather than WQMP.

# Nitrate Criteria Implementation

## *Type 1 waters (con't)*

- Scenario 3: No NJDEP-approved WQ model; Multiple NJPDES dischargers upstream of CDWSL(s)
  - *Status Quo* (i.e. WQBEL analyses conducted and, if necessary, limits set on a case-by-case basis)
  - Enhanced evaluation to ensure compliance with 5 mg/L under the appropriate design flow conditions.
  - If WQBELs imposed, allow Permittees the option to pursue necessary modeling to examine future nitrate concentrations at CDWSL(s) and levels that may be necessary to protect the CDWSL(s).

# Nitrate Criteria Implementation

## *Type 2 waters*

- Screening Evaluation for Vulnerability of Future Use:
  - Conducted on a case-by-case basis in NJPDES permits
  - Based on procedures of N.J.A.C. 7:14A-13.5
  - Target Downstream Concentration = 10 mg/L
  - Ambient flow input equal to the greater of the following flows:
    - Applicable critical stream design low flow (i.e. 1Q10)
    - Minimum flow needed to support a water supply intake (TBD)
- No WQBELs imposed in Type 2 waters
- Other types of permit conditions imposed depending on results of vulnerability screening evaluation.

**Are the surface waters upstream of an existing non-Delaware River CDWSL whose associated treatment does not ensure compliance with the Nitrate primary drinking water standard?**

**Y  
E  
S**

### **Type 1**

#### **Public Potable Water Supply (PPWS) Use Waters**

WQ modeling to examine vulnerability of CDWSL(s) to existing/future point source loads.

Target concentrations of 5 mg/L @ avg. flow conditions and 10 mg/L @ critical flow conditions

Effluent permit conditions established, consistent with the provisions of N.J.A.C. 7:9B-1.5(e)1, to ensure protection of the CDWSL(s)

For multiple dischargers, upstream of a CDWSL, adopt conclusions in WQMP.

For single discharges upstream of a CDWSL, adopt conclusions in individual NJPDES permit.

**N  
O**

### **Type 2**

#### **Public Potable Water Supply (PPWS) Use Waters**

Screening evaluation conducted on a case-by-case basis consistent with the procedures of N.J.A.C. 7:14A-13.5 to examine the vulnerability of the future PPWS use to a facility's existing/future discharge loads.

Stream flow input equal to the greater of either the critical flow condition (1Q10) or the minimum flow needed to support a water supply intake (TBD).

No WQBELs imposed but other types of permit conditions may be imposed, depending on results of screening evaluation, to ensure a level of protection for the future PPWS use.

# Questions/Comments/Suggestions?

- What are your general thoughts on the Department's suggested overall approach for criteria changes and implementation of the Nitrate SWQS?
- Does this approach provide adequate protection for the CDWSLs? If not, what would?
- Does this approach address the concerns previously identified by AEA? If not, what would?